



# SB1383 Pilot Project Update

Project Description &  
Lessons Learned to-Date



# Project Summary

- The Weststeyn Dairy and DVO are working with project partner PG&E to demonstrate interconnection to the natural gas grid as an SB1383 Dairy Pilot
- Single dairy project (non-cluster)
- Derive & produce transportation fuel (“RNG”) from dairy manure
- Process will involve existing and proven anaerobic digester and biogas cleanup processes
- Manure will be digested into biomethane for injection into an existing PG&E gas main at the dairy
- All activities will take place within the dairy with little or no impacts to the surrounding community
- Target to begin flowing gas: 14 months from now



# Project Site Plan

## LEGEND

Yellow Lines are  
Dairy Property  
Boundaries

Blue boxes = new  
heifer barns

Dark Blue Line is  
PG&E Gas Main

Orange Box is  
location for digester  
& biogas upgrading

Light Blue line is  
gas line from  
compressors to  
existing tie-in by  
PG&E



Existing Tie-in

# Dairy Profile



- Dairy is near Willows
- Currently 2200 milking cows & 2500 support stock with plans under way to expand
- Digester will help optimize manure handling practices and reduce dairy operating costs
- Project will ultimately produce about 3500 diesel gallon equivalents of RNG each day
- Renewable gas from cows will be injected into existing PG&E gas main directly accessible from the dairy for re-use as vehicle fuel in California
- Dairy owns and farms 2200 acres of land. Odor and pathogen-reduced solids and digestate are excellent soil amendments.
- All activity will take place on dairy property

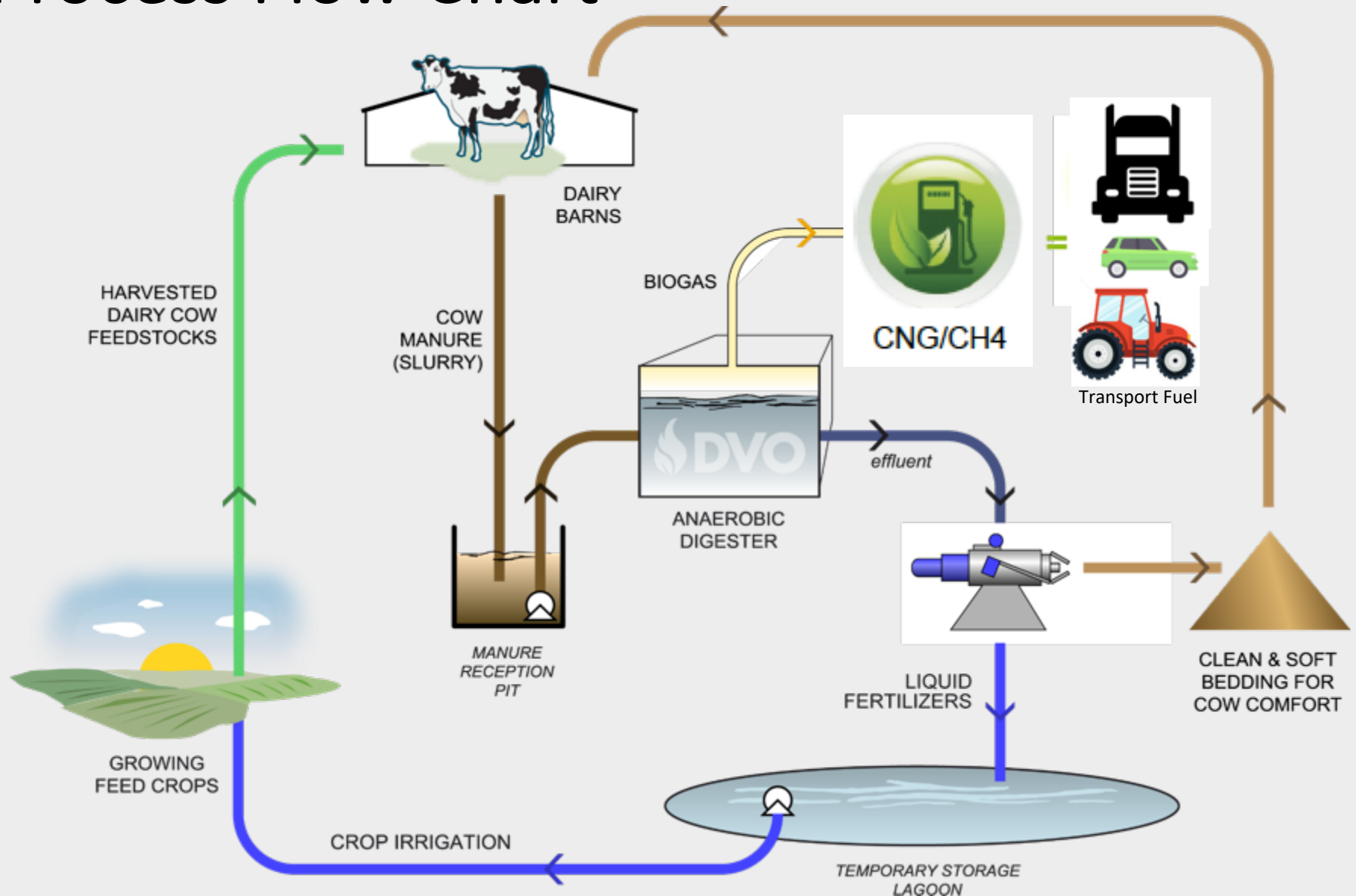


# Technology Partner

- Based in WI, with operations in California
- Founded in 1989 by Steve Dvorak, P.E.
- Gordondale Farms, WI in September 2001 – DVO's 1<sup>st</sup> digester (new design)
- DVO is the USA market leader, with 125 vessels operating at 90 sites in 19 states
- International operations (Europe, Canada, Chile, Australia, China, South Korea)
- DVO processes more dairy waste by volume than any other biogas company globally. It is the most proven technology in the industry.



# Process Flow Chart





## A typical DVO dairy installation.



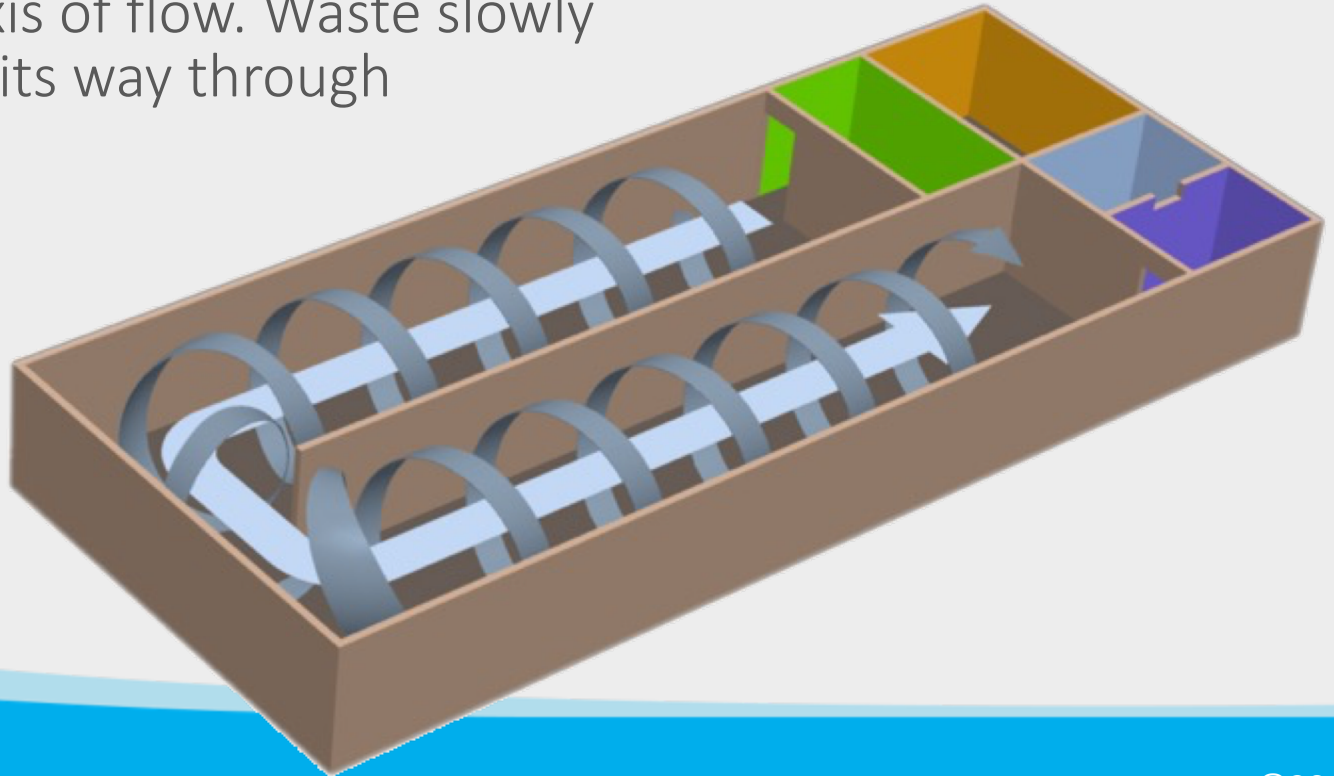
### In-ground design benefits:

- Insulated: Digester performance not prone to outside air temperature swings = consistent & more prolific biogas output year-round
- Provides structural integrity
- Not visible to neighbors

## DVO's 2-Stage Mixed Plug-Flow™

Waste flows longitudinally through the channel. As fresh waste enters one end, processed waste is pushed out the other. Typical residence time is 21 days (dairy manure).

To preserve retention time, mixing occurs around the axis of flow. Waste slowly “corkscrews” its way through the digester.

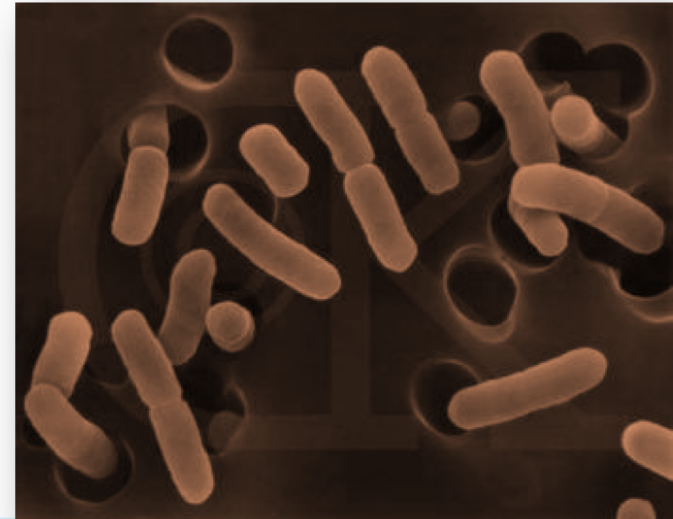




# Odor & Pathogen Control

97% Volatile Fatty Acid (VFA)  
destruction per EPA – AgSTAR study

- Via DVO's "Guaranteed Retention Time"
- Waste is collected and completely contained where the odorous VFAs are consumed in the digestion process.
- The digested liquid can be land applied without complaint.
- Pathogens such as e coli and salmonella are reduced – often to the point of non-detectability



# Reputation



- In the USA more agricultural wastes by volume are processed in DVO digesters than any other.
- 97% of all DVO digesters ever built are still in operation.
- We are fortunate to see repeat business.

# Lessons Learned To-Date...

## Still Early in the Process



- As a project partner, PG&E has been very supportive of the project and is dedicating necessary resources to move it forward
  - Working closely to develop project design (example: where to place compression as this will affect transmission extension line design)
  - PG&E is standardizing their biomethane metering skid design - lessons learned here should be helpful in future RNG projects
  - Important to communicate key milestones with PG&E team so they can schedule and provide necessary resources in a timely manner
- DVO has other RNG projects under development both inside and outside PG&E territory.
  - Lessons learned are helping facilitate understanding of RNG system design and interface with utilities and stakeholders thus promoting more methane capture and RNG production.
- Selection as an SB1383 Pilot has raised profile of project
  - Elevated community support
  - Project is raising interest in the RNG industry
  - Regional “feel good” story after the Camp Fire in nearby Paradise







# Thank You!

Comments,  
Questions,  
Feedback?



INFO@DVOINC.COM CHILTON, WI USA 920 . 849 . 9797